Gold Standard for the Global Goals

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT **- TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

KEY PROJECT INFORMATION

Programme of Activity Information

GS ID of Programme	**GS10959**
Title of Programme	Safe Water Programme in Africa and Asia
Version of POA-DD applicable to this monitoring report	05
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	

GS ID	Title
GS 11098	GS10959 VPA01 Safe Water Project in Rwanda I
GS 11133	GS10959 VPA02 Safe Water Project in Rwanda II
GS 11134	GS10959 VPA03 Safe Water Project in Rwanda III
GS 11135	GS10959 VPA04 Safe Water Project in Rwanda IV
GS 11136	GS10959 VPA05 Safe Water Project in Rwanda V
GS 11137	GS10959 VPA06 Safe Water Project in Rwanda VI
GS 11150	GS10959 VPA07 Safe Water Project in Bangladesh I
GS 11151	GS10959 VPA08 Safe Water Project in Bangladesh II
GS 11152	GS10959 VPA09 Safe Water Project in Bangladesh III
GS 11153	GS10959 VPA10 Safe Water Project in Bangladesh IV

Key Project Information

GS ID (s) of Project (s)	GS 11150, GS 11151, GS 11152, GS 11153
Title of the project (s) covered by monitoring report	GS10959 VPA07 Safe Water Project in Bangladesh I GS10959 VPA08 Safe Water Project in Bangladesh II GS10959 VPA09 Safe Water Project in Bangladesh III GS10959 VPA10 Safe Water Project in Bangladesh IV

Version number of the PDD/VPA-DD (s) applicable to this monitoring report	09
Version number of the monitoring report	04
Completion date of the monitoring report	20/02/2023
Date of project design certification	19/08/2021 for PoA and VPA
Date of Last Annual Report	N/A
Monitoring period number	1st
Duration of this monitoring period	<table><tr><th>VPA No.</th><th>Start date</th><th>End date</th></tr><tr><td>VPA07</td><td>30/07/2021</td><td>31/07/2022</td></tr><tr><td>VPA08</td><td>08/08/2021</td><td>31/07/2022</td></tr><tr><td>VPA09</td><td>11/09/2021</td><td>31/07/2022</td></tr><tr><td>VPA10</td><td>27/02/2022</td><td>31/07/2022</td></tr></table>
Project Representative	Ji BAO
Host Country	Bangladesh
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1)
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	VPA No.	Amount Achieved	Units/ Products
SDG 13 Climate Action	Reduce emission from water boiling by non-renewable biomass	VPA07	22,397	VERs
		VPA08	21,951	
		VPA09	22,402	

		VPA10	10,294	
		Total	77,044	
SDG 3 – Good Health and Well-Being	Reduce the incidence of waterborne illness within the project area		62.90%	Percentage
SDG 5 – Gender Equality	Reduce the time spent to fetch and purify water by women and girls		83.97%	Percentage
SDG 6 – Clean Water and Sanitation	Provide safe water to local residents	VPA07	13,929	Number of persons
		VPA08	12,897	
		VPA09	14,368	
		VPA10	13,630	
		Total	54,824	

Table 2 – Product Vintages

			Amount Achieved
VPA No.	**Start Dates**	**End Dates**	**VERs**
07	30/07/2021	31/12/2021	9,459
	01/01/2022	31/07/2022	12,938
08	08/08/2021	31/12/2021	8,952
	01/01/2022	31/07/2022	12,999
09	11/09/2021	31/12/2021	7,744
	01/01/2022	31/07/2022	14,658
10	27/02/2022	31/07/2022	10,294
		Total	**77,044**

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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Many people in rural area of Bangladesh rely on boreholes to provide clean water. Unfortunately, a lot of boreholes have fallen into disrepair because maintenance has been poorly managed due to lack of capacity, organization or fund. The VPAs, which are the VPA 07-10 for PoA GS 10959 "Safe Water Programme in Africa and Asia" (hereinafter referred to as "the PoA"), consists of the maintenance of 139 boreholes in Cox's Bazar District, Chittagong Division of Bangladesh during this monitoring period. The CME cooperates with a local NGO, Social Aid, to implement the VPA for providing safe water to local communities and ensure the water quality to meet the related requirements of Bangladesh and Gold Standard for the Global Goals. The project boundary is the boundary of communities that use the boreholes maintained by the project activity.

Before the implementation of the VPAs, local communities in the project location used fossil fuel and/or non-renewable biomass (Hereinafter referred to as "NRB") to boil water for purification. Therefore, the baseline scenario is that fossil fuel and/or NRB is used to boil water as means of water purification in the absence of the project activity. As a result, water purification through boiling with wood makes local people vulnerable to the negative effects of poor indoor air quality. In Bangladesh, the morality rate due to diarrhea is 7.5 deaths per 100,000. Boiling water with wood also results in significant greenhouse gas emissions through the use of non-renewable biomass, causing deforestation and threatening biodiversity. In addition, usually in local communities it is women and girls that take the unpaid work of fetching and purifying water, which minimizes their time for rest and study, and even their opportunities to have paid jobs.

The VPAs provide a solution to mitigate the above problems. The fund from sale of carbon credits generated by the VPA will make it sustainable and extendable.

A.2. Location of project

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The project is located in Cox's Bazar District, Chittagong Division of Bangladesh. The geographic coordinates of Cox's Bazar District are shown as follows.

Table 1: Geographic coordinates of Cox's Bazar District

Eastmost	Southmost	Westmost	Northmost
20°45’15”N 92°20’49”E	20°34’32”N 92°20’15”E	21°45’21”N 91°50’8”E	21°55’26”N 91°52’15”E

The location of Cox’s Bazar District is shown in the following map:

Figure 1: Cox’s Bazar District in Bangladesh

A.3. Reference of applied methodology

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Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1)

A.4. Crediting period of project

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The crediting period for each VPA is:

GS 11150: 30/07/2021-29/07/2026, twice renewable to a total of 15 years

GS 11151: 08/08/2021-07/08/2026, twice renewable to a total of 15 years

GS 11152: 11/09/2021-10/09/2026, twice renewable to a total of 15 years

GS 11153: 27/02/2022-26/02/2027, twice renewable to a total of 15 years

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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The major borehole maintenance activity is to repair broken hand pumps. BFL Hand Pumps are used in the VPAs. The pump head, body and handle are made of cast iron, pump rods are made of mild steel.

Technology:

Table 2: Manufacturer's specifications of BFL Hand Pump

Specification	Capacity
Cylinder diameter	89 mm
Maximum Stroke	215 mm
Number of persons can be served	1,000-1,500
Lifetime	15 years

Figure 2: Picture of BFL Hand Pump

There are 139 boreholes repaired in the project. In the monitoring period, the boreholes were maintained by the CME and VPA implementer, functioning well to provide enough clean water to over 50,000 local people.

There are no deviations or delays compared to information in Design Certified PDD.

Table 3: Milestone for implementation of the project

Time	Main action

23/03/2021	Time of First Submission Date
10/06/2021	Local stakeholder consultation meeting
06/2021	Starting sign Donation and Carbon Transfer Agreements with villages
07/2021	Starting repair boreholes
30/07/2021	The first borehole was repaired
19/08/2021	Date of project design certification
30/12/2021	The first time of water quality test
31/03/2022	The second time of water quality test
27/06/2022	Hygiene campaign held in Dariar Digi village Ramu cell
30/06/2022	The third time of water quality test
06/07/2022	Hygiene campaign held in Sonkhula village Cox's Bazar cell
07/07/2022	Hygiene campaign held in Dokkin Shairakhali Jolodash Para village Chakaria cell
08/07/2022	Hygiene campaign held in Jolodas Para village Ramu cell
07/08/2022-31/08/2022	Project survey was conducted
08/08/2022-01/09/2022	Water consumption field test was conducted

The dates of each borehole repaired are recorded in Excel table "1-SDG Outcomes Calculation Form-MP1st". The locations, quantity of users, days out of work of each borehole are recorded too. During this monitoring period, a few boreholes have been out of work for several days, which is excluded for calculating emission reduction. The information of each VPA is shown as follows:

Table 4: Information of each VPA

VPA No.	Rehabilitation date of the first borehole in the VPA	End date of MP1	Number of boreholes rehabilitated
VPA07	30/07/2021	31/07/2022	35
VPA08	08/08/2021	31/07/2022	34
VPA09	11/09/2021	31/07/2022	35
VPA10	27/02/2022	31/07/2022	35
		Total	139

According to the maintenance log, number of days out of work after rehabilitation for project boreholes in this monitoring period is shown below:

Borehole ID	Number of Days out of work after rehabilitation
IB14	2
IB15	1
IB16	7
IB18	3
IB20	2
IB65	1
IB66	1
IB73	1
IB75	2
IB219	1
IB220	2
IB01	5
IB02	6
IB04	2
IB42	2
IB84	2
IB103	2
IB125	1
IB186	1

There was no change from the project design that was envisaged at design certified VPA-DD in the monitoring period.

B.1.1 Forward Action Requests

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FAR # 1: VVB is required to check for double counting at both validation and verification stages by reviewing all relevant registries that could hold RECs/VERs/CERs from the considered project activity.

Reply: The CME has checked all relevant registries to make sure the project doesn't involve double counting.

FAR # 2: During the verification it also needs to be checked that the emission reductions are not claimed for the case when the borehole water is used for any other purpose than the above stated consumption (limited to drinking, cooking and basic personal hygiene).
Reply: During the water consumption field test, the purpose of water is strictly limited to drinking, food preparation and basic personal hygiene. The staff has been trained and they have explained to the users exactly.
FAR # 3: The treatment capacity limits of project technology/source are required to be monitored to ensure that the water consumption level applied for emission reductions must not be greater than the treatment capacity of the project technology/sources.
Reply: The CME has conducted a test on capacity of project borehole. It needed about 30 seconds to fill an empty 10L bucket. So in a whole day it can supply water for 1,000 persons as per the water consumption field test. The video has been submitted.

FAR # 4: The PP shall monitor the accessibility of local people to all nearby boreholes from the proposed project and other existing boreholes.
Reply: The water management committees have confirmed that the end users considered in the project only use the project boreholes rather than other existing boreholes. Households who use other water sources (i.e. non- project boreholes) have been excluded from the number recorded in the MR and the project area. This situation is also reflected in Sworn Statement.

B.2. Post-Design Certification changes

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B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

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N/A.

B.2.2. Corrections

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N/A.

B.2.3. Changes to start date of crediting period

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N/A.

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

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N/A.

B.2.5. Changes to project design of approved project

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N/A.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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SOCIAL AID is in charge of the implementation of the monitoring plan and reporting to the CME. The executive director of SOCIAL AID is responsible for supervising the whole monitoring procedure. The water and environment department is responsible for conducting baseline and project surveys as well as reporting to the executive director. The CME is in charge of designing the monitoring plan and completing the monitoring report.

Training about monitoring plan has been provided to SOCIAL AID, including survey method, data record and analysis. The monitoring plan has been carried out by qualified personnel trained for quality assurance and quality control. The CME inspects SOCIAL AID to confirm that the personnel are qualified and the monitoring plan is properly implemented.

A figure about the operational and management structure for monitoring is shown as the following:

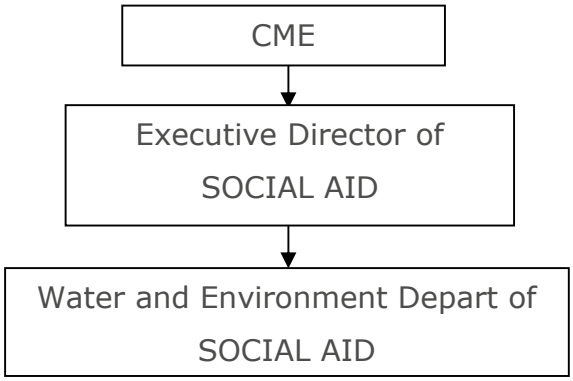

Figure 3: Operational and Management Structure for Monitoring

Borehole database

The records of the information collected in an electronic database for enabling the unique identification of the project boreholes has been kept. The database includes the following information:

- Unique identification number of each borehole

- Date of rehabilitation of each borehole
- Quantity of boreholes rehabilitated
- GPS location of each borehole
- Model of the pump for each borehole
- The total number of people obtaining their water from each borehole
- Maintenance log recorded by trained staff

All the monitoring related data will be kept by the CME and SOCIAL AID for at least two years after the crediting period or the last issuance of the project.

Every village which agrees to participate in the project has established a Water Management Committee (Hereinafter referred to as "WMC"). The members of the WMC are respectable persons elected by villagers.

Borehole maintenance

After the rehabilitation of the boreholes, the WMC is responsible for reporting all the problems of the boreholes to the CME and SOCIAL AID. And there are trained local staff of SOCIAL AID working with the WMC. If the borehole is out of work, the trained local staff shall get there as soon as possible. They can solve common faults. If they can't solve the problem, the CME and SOCIAL AID will offer more technical support and the issues can quickly be resolved through this direct line of communication.

In the case of repair is necessary, the total number of days when the borehole is out of work is recorded. This information is then used to adjust person·days for emission reductions calculation. During the monitoring period, there were a few boreholes out of work for a few days. The person·days has been adjusted.

Ongoing monitoring studies

The following ongoing monitoring studies have been conducted. The results are given in the parameter boxes in Section D.2. As per "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)", the 95/10 rule should be applied for cross VPA sampling.

- **Water consumption field test (Hereinafter referred to as "WCFT")**(Parameters $Q_{p,y}$, $Q_{p,rawboil,y}$ and $Q_{p,cleanboil,y}$)- Completed at least biennially. The survey was conducted by local staff who trained before the

survey in line with methodological requirements. The WCFT distinguished between quantity of raw or unsafe water that is still boiled and quantity of safe water boiled after the implementation of the borehole rehabilitation project. Surveyors assessed the volume of water with jerricans. This process was repeated each day until an average daily use figure has been calculated, based on household size. The WCFT was conducted in four consecutive working days. Only water for drinking, cooking and basic personal hygiene was counted. The WCFT was conducted on 08/08/2022-01/09/2022. As per the methodology, results of each household were capped at 7L. Hence the result of $Q_{p,y}$ is 7L. The result of WCFT is recorded in Excel table "3-Data Recording Form for WCFT", and has been submitted too. We used multi-stage sampling according to "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" to conduct Project Survey. We calculated through Equation (77) on Page 62 of "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" and concluded that 1 was the minimum number of boreholes should be sampled to satisfy the 95/10 rule of applied methodology. Hence, we randomly chose 6 boreholes. We randomly chose 20 user households from each borehole, i.e. 120 user households in 6 boreholes.

- **Quality of the treated water -** The quality of the treated water is assessed to ensure that it fits human consumption. The standard used to assess the water quality meets requirements of the applied methodology. It is conducted quarterly, with the first test conducted within 6 months of the project start date. At least once every two years, the water quality test should be performed in accredited laboratories. The samples were selected by Simple Random Sampling. We used equation (1) of "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" to calculate the sample size. The result is 17.76. Furthermore, according to paragraph 14 of "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)", a minimum sample size of 30 shall be chosen. We chose 40 samples out of 139 boreholes to ensure the

precision. We also used CDM sample size calculator[1] for checking the precision of the sampling. The following result shows that it meets the requirement:

Calculator to check if the precision has been met or not after a sampling survey is conducted		
Input	**Value**	**Notes**
Actual sample size	40	
Sample proportion	1.0000	
Standard error of the proportion	0.0000	
Precision associated with a proportion	0.0000	
Relative precision	0.0%	

The water quality test has been made in the Water Quality Testing Laboratory of the NGO Forum during this monitoring period on 30/12/2021, 31/03/2022 and 30/06/2022. The detailed results of each test have been submitted as a separate document.

- **Usage Survey -** The Usage Survey is included in the Project Survey, there is no individual questionnaire for Usage Survey. The Project Survey was carried out between 07/08/2022 to 31/08/2022. The result from the usage survey is 100% used to calculate emission reductions.
- **Project Survey -** We used multi-stage sampling according to "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" to conduct Project Survey. We calculated through Equation (77) on Page 62 of "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" and concluded that 2 was the minimum number of boreholes should be sampled to satisfy the 95/10 rule of applied methodology. Hence, we randomly chose 6 boreholes. We randomly chose 20 user households from each borehole, i.e. 120 user households in 6 boreholes. Data collected during the project surveys explores the following characteristics:

[1] https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fcdm.unfccc.int%2Ffilestorage%2Fe%2Fx%2Ft%2Fextfile-20150813144045637-Meth_guid48Calculator.xlsx%2FMeth_guid48Calculator.xlsx%3Ft%3DVHR8cm5rMmoxfDBG9EVaDsQHTLcuUyHkmRLI&wdOrigin=BROWSELINK

- General information - Name, address, telephone number etc.
- Household socio-demographic information.
- Water use characteristics.

  During this monitoring period the Project Survey has been conducted between 07/08/2022 to 31/08/2022. A more detailed description of the results is made in a separate document "2-Data Recording Form for Project Survey", and has been submitted too.

- **Leakage -** The PDD has described what sources of leakage were relevant to the VPA and what have been discounted.

The potential sources of leakage listed in the methodology have been investigated, and addressed below:

a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

The displaced baseline technology is three stones. It is reused outside the project boundary because it is still used for cooking after the implementation of the Project. This leakage source can therefore be discounted.

b) Non-project users who previously used lower emitting energy sources with NRB or fossil fuels saved under the project activity.

The costs of low emitting water purification technologies, such as filtration and chlorination, are much higher than boiling with wood fuel. Users of these technologies are not price sensitive. Therefore, the implementation of the Project does not lead these users to boil water with wood fuel, even if the price of wood fuel becomes cheaper because of the reduction of demand caused by the Project. This leakage source can therefore be discounted.

c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

Considering that the project only saves 42,316 tons ($B_{b,y}$) of biomass annually while the total amount of above-ground biomass of Bangladesh is 177 million tons[2], the Project does not affect NRB fraction.

[2] Table 18, Global Forest Resources Assessment 2015

d) The VPA population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.
The space heating effect of boiling water is negligible. Therefore it is highly unlikely that some other form of heating will be adopted for compensating the space heating effect of boiling water.
e) By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

The project does not promote any new technology with high efficiency. It does not stimulate people to boil water.

Therefore, a value of 0 is applied for leakage during this monitoring period.
Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

Hygiene campaign – We have held four hygiene campaigns in four villages from four VPA respectively during this monitoring period. The first one was held in Dariar Digi village Ramu cell on 27/06/2022, the second one was held in Sonkhula village Cox's Bazar cell on 06/07/2022, the third one was held in Dokkin Shairakhali Jolodash Para village Chakaria cell on 07/07/2022, the last one was held in Jolodas Para village Ramu cell on 08/07/2022. Each hygiene campaign was held with many habitants of villages. The agenda of campaign was:
a) The campaign was started with greeting from village's leader.
b) Self-introduction of village administration committee leaders and local boreholes rehabilitation project staff.
c) Presentation of prepared module related to Hygiene and Sanitation campaign done by an expert from the boreholes rehabilitation project.
d) Questions, wishes and recommendations proposed by habitants.
e) Community work of cleaning on boreholes.

The detailed description of the hygiene campaigns during this monitoring period has been provided in a separate document.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

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SDG13

Data/parameter	C_j
Unit	Percentage
Description	Percentage of users of project technology who were already in baseline using a non-boiling safe water supply
Source of data	Baseline survey in registered PDD
Value(s) applied	0
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The Baseline Survey was conducted by representative and random sampling during from 08/05/2021 to 22/05/2021. The result is 0.
Purpose of data	Calculation of baseline and project emissions (SDG 13) as well as number of persons consuming safe water supplied by the Project (SDG 6)
Additional comment	Also used for SDG 6

Data/parameter	X_{boil}
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary.
Source of data	Baseline survey in registered PDD
Value(s) applied	0
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of

	activities (Version 04.0)". The Baseline Survey was conducted by representative and random sampling during from 08/05/2021 to 22/05/2021. The result is 0.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$\mathbf{W_{b,y}}$
Unit	t/L
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of baseline scenario b during year y
Source of data	Default value
Value(s) applied	0.0004
Choice of data or Measurement methods and procedures	The default value of $W_{b,y}$ for firewood as per "Application of TPDDTEC Methodology to Safe Water Supply Projects"
Purpose of data	Calculation of baseline emissions
Additional comment	Should be updated if ongoing monitoring surveys show that baseline water boiling technologies change over time.

Data/parameter	$\mathbf{W_{p,y}}$
Unit	t/L
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of project scenario p during year y
Source of data	Default value
Value(s) applied	0.0004
Choice of data or Measurement methods and procedures	According to the baseline and project survey, the same water boiling technology is applied in the baseline and project scenarios. So $W_{b,y}$ and $W_{p,y}$ are equal
Purpose of data	Calculation of project emissions
Additional comment	Should be updated if ongoing monitoring surveys show that baseline water boiling technologies change over time.

Data/parameter	$f_{NRB,b,y}$
Unit	Percentage
Description	Fraction of biomass used that can be established as non – renewable biomass in the baseline scenario b during year y
Source of data	As per the "TOOL30: Calculation of the fraction of non-renewable biomass, version 3.0". Please refer to registered PDD.
Value(s) applied	95.76%
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$EF_{b,fuel,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor of fuels used in the baseline scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5
Value(s) applied	112
Choice of data or Measurement methods and procedures	According to the baseline survey, wood is the only fuel used in the baseline scenario.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	GWP_{CH4}
Unit	-
Description	Global warming potential for CH_4
Source of data	IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	28
Choice of data or Measurement methods and procedures	As per "IPCC Fifth Assessment Report: Climate Change 2014", the value is 28.

Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	**GWP_{N2O}**
Unit	-
Description	Global warming potential for N_2O
Source of data	IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	265
Choice of data or Measurement methods and procedures	As per "IPCC Fifth Assessment Report: Climate Change 2014", the value is 265.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	**$EF_{b,fuel,non\ co2}$**
Unit	tCO_2/TJ
Description	Non CO_2 emission factor of fuels used in the baseline scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	9.46
Choice of data or Measurement methods and procedures	According to the baseline survey, wood is the only fuel used in the baseline scenario. As per "IPCC 2006 Guidelines for National Greenhouse gas Inventories", the default emission factor of CH_4 and N_2O for stationary combustion is 0.3t/TJ and 0.004t/TJ, respectively. As per "IPCC Fifth Assessment Report: Climate Change 2014", the global warming potential for CH_4 and N_2O is 28 and 265, respectively. So $EF_{b,non\ co2} = 0.3\times28+0.004\times265 = 9.46$.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	**$NCV_{b,fuel}$**
Unit	TJ/ton

Description	Net calorific value of the fuels used in the baseline
Source of data	IPCC default value for wood IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	According to the baseline survey, wood is the only fuel used in the baseline scenario.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$f_{NRB,p,y}$
Unit	Percentage
Description	Fraction of biomass used that can be established as non – renewable biomass in the project scenario p during year y
Source of data	As per the "TOOL30: Calculation of the fraction of non-renewable biomass, version 3.0". Please refer to registered PDD.
Value(s) applied	95.76%
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of project emissions
Additional comment	-

Data/parameter	$EF_{p,fuel,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor of fuels used in the project scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5
Value(s) applied	112
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario.

Purpose of data	Calculation of project emissions
Additional comment	-

Data/parameter	**$EF_{p,fuel,non\ co2}$**
Unit	tCO_2/TJ
Description	Non CO_2 emission factor of fuels used in the project scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	9.46
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario. As per IPCC 2006 Guidelines for National Greenhouse gas Inventories, the default emission factor of CH_4 and N_2O for stationary combustion is 0.3t/TJ and 0.004t/TJ, respectively. As per IPCC Fifth Assessment Report: Climate Change 2014, the global warming potential for CH_4 and N_2O is 28 and 265, respectively. So $EF_{b,non\ co2}$ = $0.3\times28+0.004\times265 = 9.46$.
Purpose of data	Calculation of project emissions
Additional comment	-

Data/parameter	**$NCV_{p,fuel}$**
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project scenario
Source of data	IPCC default value for wood IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario.
Purpose of data	Calculation of project emissions
Additional comment	-

SDG 3

Data/parameter	I_b
Unit	Percentage
Description	Waterborne illness incidence in the baseline scenario
Source of data	Baseline survey in the registered PDD
Value(s) applied	62.90%
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The Baseline Survey was conducted by representative and random sampling during from 08/05/2021 to 22/05/2021. The result is 62.90%.
Purpose of data	Calculation of reduction of waterborne illness incidence
Additional comment	-

SDG 5

Data/parameter	T_b
Unit	Hour
Description	Time spent to fetch and purify water by women and girls per household per day in the baseline scenario
Source of data	Baseline survey in the registered PDD
Value(s) applied	2.62
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The Baseline Survey was conducted by representative and random sampling during from 08/05/2021 to 22/05/2021. The result is 2.62.
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	-

D.2 Data and parameters monitored

>>

SDG 13

Data/parameter	$Q_{p,y}$
Unit	Litres per person per day
Description	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Source of data	Water consumption field test
Value(s) applied	7
Measurement methods and procedures	The data obtained by WCFT through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The WCFT was conducted by CME and SOCIAL AID from 08/08/2022-01/09/2022. The actual value is 14.28L. According to the applied methodology, the cap value for full-day premises is 7. The actual value is much higher than the capped value. So we choose the smaller value between the cap value and the value from test for conservativeness. The result is 7.
Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to no later than 29/07/2023 as per the applied methodology
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$Q_{p,rawboil,y}$
Unit	Litres per person per day
Description	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology.
Source of data	Water consumption field test
Value(s) applied	0
Measurement methods and procedures	The data is obtained by water consumption field test through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version

	04.0)". The WCFT was conducted by the CME and SOCIAL AID from 08/08/2022-01/09/2022 and the result is 0.
Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to no later than 29/07/2023 as per the applied methodology
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of baseline and project emissions
Additional comment	

Data / Parameter	$Q_{p,cleanboil,y}$
Unit	Litres per person per day
Description	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
Source of data	Water consumption field test
Value(s) applied	0
Measurement methods and procedures	The data is obtained by water consumption field test through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The WCFT was conducted by the CME and SOCIAL AID from 08/08/2022-01/09/2022 and the result is 0.
Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to no later than 29/07/2023 as per the applied methodology
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of project emissions
Additional comment	

Data / Parameter	**Quality of the treated water**
Unit	-

Description	As a first option, projects shall meet host country standards (where available) for treated water quality. Where national standards are not available, projects shall meet WHO standard of less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml.
Source of data	Water quality test
Value(s) applied	Pass
Measurement methods and procedures	As per the local laboratories' methods and procedures. The 95/10 precision rule must be followed in calculating the sample size required for testing water quality.
Monitoring frequency	Quarterly. The first test has been conducted within 6 months of the project start date. The water quality test has been made in the Water Quality Testing Laboratory of the NGO Forum. The lab collected the samples from the water sources. At least once every two years, the water quality test should be performed in accredited laboratories.
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions
Additional comment	-

Data / Parameter	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p during year y
Source of data	Annual usage survey
Value(s) applied	100%
Measurement methods and procedures	It is determined by usage survey in this monitoring period with sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". And the Project Survey and Usage Survey have been

	conducted together using the same sample, thus there is no separate documents. Please refer to document "2-Data Recording Form for Project Survey".
Monitoring frequency	Annually; the above value is valid from 30/07/2021 to no later than 31/07/2022 as per the usage (project) survey
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions (SDG 13) and number of persons consuming safe water supplied by the Project (SDG 6)
Additional comment	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario as per Section 3.1 of the applied methodology. Also used for SDG 6.

Data / Parameter	$\mathbf{N_{p,y}}$
Unit	Persons.days
Description	Number of person.days consuming water supplied by project scenario p through year y
Source of data	D14-18 of sheet SDG13 of Excel table "1-SDG Outcomes Calculation Form-MP1st"
Value(s) applied	Each VPA is shown as follows:
Measurement methods and procedures	Sum of the total number of people using each borehole in the VPA multiplied by the number of operating days in the monitoring period. The number of days when the boreholes are in operation is monitored through project survey. The number of days when the boreholes are out of use has not be taken into account for calculating $N_{p,y}$.

VPA No.	Persons.days
VPA07	4,393,389
VPA08	4,305,913
VPA09	4,394,453
VPA10	2,019,325
Total	15,113,080

Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to 31/07/2022 as per the maintenance log
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of baseline emissions and project emissions
Additional comment	-

Data / Parameter	$\mathbf{LE_{p,y}}$
Unit	tCO_2e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0
Measurement methods and procedures	The result is 0 and the details are shown in Section E.3.
Monitoring frequency	Biennially; the above value is valid from 30/07/2021 to no later than 31/07/2022 as per the monitoring report
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions
Additional comment	-

SDG 3

Data / Parameter	$\mathbf{I_{p,y}}$
Unit	Percentage
Description	Waterborne illness incidence in the project scenario during year y
Source of data	B127 of Excel table "2-Data Recording Form for Project Survey"
Value(s) applied	0
Measurement methods and procedures	The data is obtained by project survey through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The project survey was conducted by the CME and

	SOCIAL AID from 07/08/2022-31/08/2022 and the result is 0.
Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to 31/07/2022 as per the project survey
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of reduction of waterborne illness incidence
Additional comment	

SDG 5

Data / Parameter	$T_{p,y}$
Unit	Hour
Description	Time spent to fetch and purify water by women and girls per household per day in the project scenario during year y
Source of data	B128 of Excel table "2-Data Recording Form for Project Survey"
Value(s) applied	0.42
Measurement methods and procedures	The data is obtained by project survey through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The project survey was conducted by the CME and SOCIAL AID from 07/08/2022-31/08/2022 and the result is 0.42.
Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to 31/07/2022 as per the project survey.
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	

SDG 6

Data / Parameter	$P_{p,y}$
Unit	Number
Description	Number of persons consuming water within the project area during year y
Source of data	Project survey
Value(s) applied	Each VPA is shown as follows:
Measurement methods and procedures	The data is obtained from WMC of each borehole as per Document "Sworn Statement"
Monitoring frequency	At least biennially; the above value is valid from 30/07/2021 to no later than 29/07/2023.
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of number of persons consuming safe water supplied by the project
Additional comment	

VPA No.	Py
VPA07	13,929
VPA08	12,897
VPA09	14,368
VPA10	13,630
Total	54,824

Data / Parameter	**Hygiene campaigns**
Unit	-
Description	Hygiene campaigns carried out among project technology users.
Source of data	Annual hygiene campaigns reports
Value(s) applied	We have held four hygiene campaigns in four villages from four VPA respectively during this monitoring period. The first one was held in Dariar Digi village Ramu cell on 27/06/2022, the second one was held in Sonkhula village Cox's Bazar cell on 06/07/2022, the third one was held in Dokkin Shairakhali Jolodash Para village Chakaria cell on

	07/07/2022, the last one was held in Jolodas Para village Ramu cell on 08/07/2022.
Measurement methods and procedures	Questionnaires and interviews are used in hygiene campaigns to assess hygienic handling of clean water.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Assessment of achievement of SDG 6
Additional comment	Any major changes in the health status of the water users as a result of contaminated water (e.g. an outbreak of water related disease) must be reported.

D.3. Comparison of monitored parameters with last monitoring period

N/A.

D.4. Implementation of sampling plan

>>

a) Description of implemented sampling design

(1) Objectives and reliability requirements

The objective is to obtain an unbiased and reliable estimate of the proportion or mean value of the following parameters over the course of the monitoring period. As per "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)", the 95/10 rule should be applied for cross VPA sampling.

(2) Target population

The target populations are boreholes maintained by the VPA07-10 and households consuming safe water provided by the VPA07-10. The target population of boreholes is 139, the target population of households is 8,582.

(3) Sampling method

Since VPA07-10 of PoA GS 10959 are in the same district, using same technologies and sharing same baseline scenario, representative and random cross VPA sampling has been applied in these VPAs.

Multi-stage sampling combines the cluster and simple random sampling approaches in a two-stage sampling scheme which enables us to randomly select some boreholes and then randomly sample some households who using those boreholes. As with simple random sampling and cluster sampling, we are assuming homogeneity across

boreholes in the usage of boreholes. We know that the 8,582 households are using 139 boreholes. $Q_{p,y}$, $Q_{p,rawboil,y}$, $Q_{p,cleanboil,y}$, $U_{p,y}$, $I_{p,y}$ and $T_{p,y}$ are sampled by multiple stage sampling, and water quality is sampled by simple random method.

(4) Sampling size

As per the applied methodology, the following guidelines are applied to calculate the sample size:

Group size < 300 (for water quality): Minimum sample size 30 or population size, whichever is smaller;

Group size > 1,000(for $Q_{p,y}$, $Q_{p,rawboil,y}$, $Q_{p,cleanboil,y}$, $U_{p,y}$, $I_{p,y}$ and $T_{p,y}$): Minimum sample size 100.

As per "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09 .0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)", the 95/10 rule are applied for cross VPA sampling.

The results are summarized in Excel tables "Data Recording Form for Project Survey" and "Data Recording Form for WCFT", which have been submitted.

(5) Sampling frame

The frame is a list of all households supplied by the boreholes in the project. The samples are selected from this list. The samples are randomly selected across the population. The entire target population has an equal chance of being selected, thus the samples selected are deemed to be representative of population.

b) Collected data

The following parameters are determined by sampling in this monitoring period:

Parameter	Description	Frequency
$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day	At least biennially
$Q_{p,rawboil,y}$	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology	At least biennially
$Q_{p,cleanboil,y}$	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology	At least biennially
$U_{p,y}$	Usage rate in project scenario p during year y	Annually

$I_{p,y}$	Waterborne illness incidence in the project scenario during year y	Annually
$T_{p,y}$	Time spent to fetch and purify water by women and girls per household per day in the project scenario during year y	Annually
Water Quality	Performance of the treatment technology – less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml of safe water	Quarterly

The main survey methods applied in the sampling plan include hardcopy questionnaires, face to face interview and telephone interview. The potential of refusals and other means of non-responses have been taken into account for calculation of sample size. Meanwhile, in order to minimize the rates of non-response and answer bias, the questionnaires have been designed by professional team and widely tested before use. The CME and SOCIAL AID is in charge of the implementation of the sampling plan. The Usage Survey is included in the Project Survey, so there is no individual questionnaire for Usage Survey. The Project Survey was carried out between 07/08/2022 to 31/08/2022. The data collected from the surveys was compiled into the "Data Recording Form for Project Survey" Excel table. The WCFT was carried out between 08/08/2022-01/09/2022. The data collected from the surveys was compiled into the "Data Recording Form for WCFT" Excel table. Two documents have been submitted.

c) Analysis

Data obtained from the samples were used to estimate values for the parameters described above. The Column P of "2- Data Recording Form for Project Survey" Excel table shows 100% of sample households use Borehole; the Column AB shows women and girls spend 0.42 hour to fetch water every day.

The values have been used to calculate the SDG outcomes:

Parameter	Meaning	Value	Unit
$U_{p,y}$	Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate	100%	percentage
$I_{p,y}$	Waterborne illness incidence in the project scenario during year y	0	Percentage
$T_{p,y}$	Time spent to fetch and purify water by women and girls per household per day in the project scenario during year y	0.42	h

$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day	7	L
$Q_{p,rawboil,y}$	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology	0	L
$Q_{p,cleanboil,y}$	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology	0	L
Water Quality	Performance of the treatment technology – less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml of safe water	Meet the requirement	

Please refer to the "1-SDG Outcomes Calculation Form-MP1st" Excel table.

d) Demonstration that the required confidence/precision level has been met

As calculated in above (4) of (a), the minimum number of boreholes to be sampled for Project Survey and WCFT is two. Since we have sampled six boreholes, the required 95/10 confidence level has been met has been met.

e) Demonstration that the samples were randomly selected and are representative of the population

The samples were randomly selected using random number generating function of Excel. The entire target population has an equal chance of being selected. Therefore, the samples selected are representative of the population.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

>>

SDG 13: Climate Action

Baseline Scenario Fuel Consumption Calculation:

$$B_{b,y} = (1 - X_{boil}) * (1 - C_j) * N_{p,y} * W_{b,y} * (Q_{p,y} + Q_{p,rawboil,y}) \quad (1)$$

Where:

$B_{b,y}$ Quantity of fuel consumed in baseline scenario b during the year in tons

X_{boil} Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary; the applied value is 0 as per section D.1.

C_j Percentage of users of project technology who were already in baseline scenario using a non-boiling safe water supply; the applied value is 0 as per section D.1.

$N_{p,y}$ Number of person.days consuming water supplied by project scenario p through year y; the applied value as per Section D.2.

$W_{b,y}$ Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per baseline water boiling Test; the applied value is 0.0004 as per Section D.1.

$Q_{p,y}$ Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day; the applied value is 7 as per Section D.1.

$Q_{p, rawboil,y}$ Quantity of raw water boiled in the project scenario p per person per day; ; the applied value is 0 as per Section D.1.

As a result, $B_{b,y}$ is shown as follows:

VPA No.	$B_{b,y}$
VPA07	12,301.49
VPA08	12,056.56
VPA09	12,304.47
VPA10	5,654.11
Total	42,316.62

Baseline Emission Reductions:

$$BE_{b,y} = B_{b,y} *((f_{NRB,b,y} * EF_{b,fuel,CO2}) + EF_{b,fuel,non-CO2}) * NCV_{b,fuel} \quad (2)$$

Where:

$BE_{b,y}$ Baseline emissions during year y

$B_{b,y}$ Quantity of fuel consumed in baseline scenario b during the year in tons; the applied value as per calculation in this section above;

$f_{NRB,b,y}$ Fraction of biomass used that can be established as non-renewable biomass in baseline scenario b during year y; the applied value is 0.9576 as per section D.1.

$EF_{b,fuel,CO2}$ CO_2 emission factor of fuels used in the baseline scenario; the applied value is 112 as per section D.1.

$EF_{b,fuel,non-CO2}$ Non-CO_2 emission factor of fuels used in the baseline scenario; the applied value is 9.46 as per section D.1.

$NCV_{b,fuel}$ Net calorific value of fuels used in the baseline scenario; the applied value is 0.0156 as per section D.1.

As a result, $BE_{b,y}$ is shown as follows:

VPA No.	$BE_{b,y}$
VPA07	22,397
VPA08	21,951
VPA09	22,402
VPA10	10,294
Total	77,044

SDG 3: Good health and well-being

The outcome of SDG 3 is quantified as the reduction of waterborne illness incidence compared to baseline scenario. The waterborne illness incidence in the baseline scenario is 62.90% according to Baseline Survey.

SDG 5: Gender equality

The outcome of SDG 5 is quantified as percentage reduction of time spent to fetch and purify water by women and girls. The time spent to fetch and purify water by women and girls per household per day in the baseline scenario is 2.62 hour according to Baseline Survey.

SDG 6: Clean Water and Sanitation

The outcome of SDG 6 is quantified as number of persons consuming safe water supplied by the project, the direct outcome is calculated, see section E.2.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

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SDG 13: Climate Action

Project Scenario Fuel Consumption Calculation

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{p,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y}) \quad (3)$$

Where:

$B_{p,y}$	Quantity of fuel f consumed in project scenario p during the year y in tons
C_j	Percentage of users of project technology who were already in baseline scenario using a non-boiling safe water supply; the applied value is 0 as per section D.1.
$N_{p,y}$	Number of person.days consuming water supplied by project scenario p through year y; the applied value as per Section D.2.
$W_{p,y}$	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per baseline water boiling Test; the applied value is 0.0004 as per Section D.1.
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day; the applied value is 0 as per Section D.2.
$Q_{p,cleanboil,y}$	Quantity of safe water boiled in the project scenario p per person per day in year y; the applied value is 0 as per Section D.2.

As a result, $B_{p,y} = 0$ t

Project Emission Reductions:

$$PE_{p,y} = B_{p,y} * ((f_{NRB,p,y} * EF_{p,fuel,CO2}) + EF_{p,fuel,non-CO2}) * NCV_{p,fuel} \quad (4)$$

Where:

$BE_{b,y}$	Baseline emissions during year y
$PE_{p,y}$	Project emissions during year y
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons; the applied value is 0 as per calculation in this section above;

$f_{NRB,p,y}$ Fraction of biomass used that can be established as non-renewable biomass in project scenario p during year y; the applied value is 0.9576 as per section D.1.

$EF_{b,fuel,non\text{-}CO2}$ Non-CO_2 emission factor of fuels used in the baseline scenario; the applied value is 9.46 as per section D.1.

$EF_{p,fuel,CO2}$ CO_2 emission factor of fuels used in the project scenario; the applied value is 112 as per section D.1.

$EF_{p,fuel,non\text{-}CO2}$ Non-CO_2 emission factor of fuels used in the project scenario; the applied value is 9.46 as per section D.1.

$NCV_{p,fuel}$ Net calorific value of fuels used in the project scenario; the applied value is 0.0156 as per section D.1.

ER_y Overall emission reductions achieved by the project activity during year y

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate; the applied value is 100% as per section D.2.

$LE_{p,y}$ Leakage from project scenario p during year y; the applied value 0 as per section D.2.

As a result, $PE_{p,y}$= 0 tCO_2e

SDG 3: Good health and well-being

The outcome of SDG 3 is quantified as the reduction of waterborne illness incidence compared to baseline scenario, which is calculated as follows:

$$I_{r,y} = I_b - I_{p,y} \quad (5)$$

Where:

$I_{r,y}$ Reduction of waterborne illness incidence in year y

I_b Waterborne illness incidence in the baseline scenario; the applied value is 62.90% as per section D.1.

$I_{p,y}$ Waterborne illness incidence in the project scenario during year y; the applied value is 0 as per section D.2.

As a result, $I_{r,y}$ = 62.90%

SDG 5: Gender equality

The outcome of SDG 5 is quantified as percentage reduction of time spent to fetch and purify water by women and girls, which is calculated as follows:

$$T_{r,y} = (T_b - T_{p,y})/T_b \quad (6)$$

Where:

$T_{r,y}$ Percentage reduction of time spent to fetch and purify water by women and girls in year y

T_b Time spent to fetch and purify water by women and girls per household per day in the baseline scenario; the applied value is 2.62 as per section D.1.

$T_{p,y}$ Time spent to fetch and purify water by women and girls per household per day in the project scenario during year y; the applied value is 0.42 as per section D.2.

As a result, $T_{r,y}$ = 83.97%

SDG 6: Clean Water and Sanitation

The outcome of SDG 6 is quantified as number of persons consuming safe water supplied by the Project, which is calculated as follows:

$$P_y = P_{p,y} * (1-C_j) * U_{p,y} \quad (7)$$

Where

P_y Number of additional persons consuming safe water supplied by the Project compared to the baseline scenario during year y

$P_{p,y}$ Number of persons consuming water within the project area during year y; the applied value as per section D.2.

C_j Percentage of users of project technology who were already in baseline scenario using a non-boiling safe water supply; the applied value is 0 as per section D.1.

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p during year y; the applied value is 100% as per section D.2.

As a result, P_y is shown as follows:

VPA No.	P_y

VPA07	13,929
VPA08	12,897
VPA09	14,368
VPA10	13,630
Total	54,824

E.3. Calculation of leakage

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As per the applied methodology and the registered VPA DD, the leakage is expected to be 0, which can be ignored.

However, to confirm that leakage can be deemed as very low, the below described leakage assessment regarding the potential leakage sources (listed in the methodology TPDDTEC, pages 15) shall be completed every two years. During this monitoring period, $LE_{p,y}$ is estimated as follows:

Potential Influence Factor	Interpretation
The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.	The displaced baseline technology is three stones. It has not been reused outside the project boundary because it still be used for cooking after the implementation of the project.
Non-project users who previously used lower emitting energy sources use the non-renewable biomass or fossil fuels saved under the project activity.	The costs of low emitting water purification technologies, such as filtration and chlorination, are much higher than boiling with wood fuel. Users of these technologies are not price sensitive. Therefore, the implementation of the VPAs do not lead these users to boil water with wood fuel, even if the price of wood fuel becomes cheaper because of the reduction of demand caused by the project.
The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.	Considering that the VPAs only saves 42,316 tons ($B_{b,y}$) of biomass annually while the total amount of above-ground biomass of Bangladesh is 177 million tons, the VPAs do not affect NRB fraction.
The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.	The space heating effect of boiling water is negligible. Therefore, it is highly unlikely that some other form of heating will be adopted for compensating the space heating effect of boiling water.

By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.	The project does not promote any new technology with high efficiency. It does not stimulate people to boil water.

In conclusion, $LE_{p,y} = 0$

$$ER_y = (\Sigma BE_{b,y} - \Sigma PE_{p,y}) * U_{p,y} - \Sigma LE_{p,y} \quad (8)$$

As a result,

VPA No.	Year	ER_y
VPA07	30/07/2021 -31/07/2022	22,397
VPA08	08/08/2021 -31/07/2022	21,951
VPA09	11/09/2021 -31/07/2022	22,402
VPA10	27/02/2022 -31/07/2022	10,294
	Total	77,044

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	GS ID	Baseline estimate	Project estimate	Net benefit
13	Reduce emission from water boiling by non-renewable biomass	GS 11150	22,397	0	22,397
		GS 11151	21,951	0	21,951
		GS 11152	22,402	0	22,402
		GS 11153	10,294	0	10,294
		Total	77,044	0	77,044
3	Reduce the incidence of waterborne illness within the project area		62.90%	0	62.90%

5	Reduce the time spent to fetch and purify water by women and girls		2.62hour	0.42hour	83.97%
6	Provide safe water to local residents	GS 11150	0	13,929	13,929
		GS 11151	0	12,897	12,897
		GS 11152	0	14,368	14,368
		GS 11153	0	13,630	13,630
		Total	0	54,824	54,824

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	GS ID	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[3] achieved during this monitoring period
13	GS 11150	58,696 tCO_2e	22,397 tCO_2e
	GS 11151	57,256 tCO_2e	21,951 tCO_2e
	GS 11152	51,819 tCO_2e	22,402 tCO_2e
	GS 11153	24,790 tCO_2e	10,294 tCO_2e
3	GS 11150	32.90%	62.90%
	GS 11151	32.90%	62.90%

[3] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

	GS 11152	32.90%	62.90%
	GS 11153	32.90%	62.90%
5	GS 11150	61.83%	83.97%
	GS 11151	61.83%	83.97%
	GS 11152	61.83%	83.97%
	GS 11153	61.83%	83.97%
6	GS 11150	33,000 person	13,929 person
	GS 11151	33,000 person	12,897 person
	GS 11152	33,000 person	14,368 person
	GS 11153	33,000 person	13,630 person

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

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According to approved PDD, annual emission reduction achieved by the project activity is 58,376tCO_2e, this monitoring period is from 30/07/2021 to 31/07/2022. So, ex-ante emission reduction of each VPA for this monitoring period:

GS ID	Start date	End date	Values estimated in ex ante calculation of approved PDD
GS 11150	30/07/2021	31/07/2022	58,696
GS 11151	08/08/2021	31/07/2022	57,256
GS 11152	11/09/2021	31/07/2022	51,819
GS 11153	27/02/2022	31/07/2022	24,790
Total			192,561

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

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The actual values of each VPA of SDG 13 are lower than estimated value because the rehabilitation of boreholes in each VPA took several months. But when we calculate the estimated emission reduction ex-ante, we use the first date the borehole was

repaired of the VPA. The actual operating days of other boreholes are much shorter during this monitoring. And the number of users is less than half of that we estimated before.

The fact that the actual value of SDG 3 is higher than estimated value is due to several reasons:
a) clean water supplied by the project has a good quality, which has been proved by the water quality tests;
b) local people have developed a better healthy habit by the convenience of getting clean water and hygiene campaigns.

The actual value of SDG 5 is higher than estimated value because estimated value ex-ante was a conservative estimate, whereas monitored data is an accurate representation by sampling.

The actual values of SDG 6 are lower than estimated value because the number of users is less than we estimated before.

SECTION F. SAFEGUARDS REPORTING

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According to Section B.7 of Design Certified PDD, safety of water disinfectants used in the VPA should be monitored. But during this monitoring period, the water quality meets the relevant requirements, so we have not used water disinfectants. Hence no parameter needs to be monitored in this section.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

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We offer different ways of continuous input and grievance mechanism in accordance with PDD.

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.

Continuous Input / Grievance Expression Process Book (mandatory)	The offices of all the villages where the VPA has been implemented
GS Contact (mandatory)	help@goldstandard.org
Email	Mr. Ji BAO: baoji@icebergchina.com Engr. Md. Babul Aktar: ed@socialaid.org.bd
Cell Phone	Engr. Md. Babul Aktar: +88-01712080178 Md Maruf: 01887670849 Md Rashel: 01889528429 Md Rashed: 01827-041033 Nuri Akter: 01839566480 Md Kamal Uddin: 01818138805

During this monitoring period, no Inputs or Grievances has been received during this monitoring period.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

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Not applicable. No stakeholder mitigations were agreed to be monitored.

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

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No legal contest or dispute has arisen.

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption